INFORMATION SERVICES
MARKET OPPORTUNITY ANALYSIS

SPECIAL MARKET STUDY

FOR

BECHTEL INFORMATION SERVICES

April 15, 1987

Prepared By

INPUT
1943 Landings Drive
Mountain View, CA 94043
(415) 960-3990

Digitized by the Internet Archive
in 2015

https://archive.org/details/marketstudyforbe01unse

INFORMATION SERVICES
MARKET OPPORTUNITY ANALYSIS

CONTENTS

		Page
I	INTRODUCTION	1
II	EXECUTIVE OVERVIEW	3
	A. Market Overview	3
	B. Federal Government Market Analysis	8
	C. Commercial Market Analysis	12
	D. Market Factors	12
	E. Contract Examples	14
	1. Examples of IBM Activity	14
	2. Examples of GM/EDS Activities	15
	3. Examples of Other Activities	15
	F. Bechtel-Specific Recommendations	16
	1. Segments to Pursue	16
	2. Keys to Success	18
	3. Entry Plan	19
	4. Tactics	20
	5. Staffing	21
III	INFORMATION SERVICES MARKET OVERVIEW	23
	A. Market Size and Components	23
	B. Facilities Management Market Overview	26
	1. Market Characteristics	26
	a. Operational Facilities Management	26
	b. Facilities Management Integration	27
	2. Market Size and Driving Forces	28
IV	FEDERAL GOVERNMENT FACILITIES MANAGEMENT MARKET ANALYSIS	31
	A. Overview	31
	B. Market Factors	32
	C. Market Size/Vendor Activity	34
V	COMMERCIAL FACILITIES MANAGEMENT MARKET ANALYSIS	41
	A. Overview	41
	B. Market Factors	41
	C. Vendor Analysis	44
	1. Current and Future FMI Vendors	44
	2. Future Changes in the Vendor Community	44

INPUT
ZBH1-741-1987

Page

D. Contract Examples 45
1. Examples of IBM Activity 45
2. Examples of Control Data Activities 46
3. Examples of GM/EDS Activities 46
4. Examples of Other Activities 47
E. Bechtel - FM Market Profile 48

VI BECHTEL-SPECIFIC RECOMMENDATIONS 51
A. Segments to Pursue 51
B. Keys to Success 53
C. Entry Plan 54
1. Strategy 54
2. Tactics 55
3. Staffing 57
D. Vendor Selection Criteria 57
E. Market Sizing, 1987-1989 58

APPENDIX A: LEADING COMPETITORS 61

APPENDIX B: FM INTEGRATION 65

APPENDIX C: FEDERAL GOVERNMENT FM MARKET 69

APPENDIX D: FEDERAL GOVERNMENT OPPORTUNITIES 73

APPENDIX E: COMPETITORS IN COMMERCIAL FM 79
A. Federal Government FM Vendors 79
B. Computer Hardware Vendors 80
C. Accounting Firms 80
D. Management Services Firms 81

APPENDIX F: VENDOR SELECTION CRITERIA..... 83

INFORMATION SERVICES
MARKET OPPORTUNITY ANALYSIS

EXHIBITS

			Page
II	-1	Computer and Communications Professional Services	5
III	-1	Computer and Communications Facilities Services	25
V	-1	Sample Facilities Management Projects	49
VI	-1	Federal Government Facilities Management Market	59

I INTRODUCTION

I INTRODUCTION

- This report examines the opportunities for Bechtel in the information services marketplace. More specifically, the report covers the segments of the market that INPUT advises Bechtel to pursue aggressively--professional services and facilities management.

- The specific opportunity that presents the best fit for Bechtel is the computer and communications facilities management (FM) segment of the professional services and facilities management markets, which will be the specific focus of this report.

- The report is organized into six sections:

  - Introduction.

  - Information services market overview.

  - Federal government FM market analysis.

  - Commercial FM market analysis.

  - Bechtel-specific recommendations.

  - Appendices (for extra detail).

- Readers are invited to make inquires of INPUT for clarification and/or general discussion. The contact is INPUT Vice President, C. Michael Dishman, at (415) 960-3990.

II EXECUTIVE OVERVIEW

II EXECUTIVE OVERVIEW

- This is an Executive Overview of a report commissioned by Bechtel to identify opportunities for the company in the information services market. It also analyzes the specific recommended markets and provides detailed recommendations for Bechtel's market entry. The result should be a $300 million business in information services within five years.

- This Executive Overview is organized in four sections:

  - Information services market overview.

  - Federal government market analysis.

  - Commercial market analysis.

  - Bechtel-specific recommendations.

A. MARKET OVERVIEW

- The information services market reached nearly $55 billion in 1986, and INPUT projects this will grow to $123 billion by 1991. The segment recommended for Bechtel's initial entry into this market is providing professional services for computer- and communications-based projects. This segment, currently a $12 billion market, is growing at an average rate of 20% per year.

- More specifically, the Bechtel-addressable segment of the market exceeded $5 billion in 1986 and is projected to more than double to nearly $12 billion by 1991.

- While many new companies have emerged and prospered in the information services industry, the dominant players continue to be the large, well capitalized organizations. Some, like ADP, CSC, PRC, and Computer Associates, have grown as independents. Many have developed out of large companies such as Boeing and General Electric whose primary business is not information services.

- Another characteristic of the industry is that acquisition has played a key role in the growth of many of the market leaders. ADP, CSC, Computer Associates, MSA, Sterling Software, Dun & Bradstreet, McDonnell Douglas, and many others have made multiple acquisitions as a part of their market development strategy.

- Bechtel's experience with the UCCEL activity and other contracts such as the Elk Hills and SEC projects will contribute to Bechtel's ability to succeed in the information services industry. However, the opportunity INPUT sees for Bechtel is "pure" information services without the other components of a typical Bechtel project.

- Exhibit II-1 provides a graphic representation of a "typical" Bechtel project with its "typical" information services component, a subset of a traditional Bechtel job. The exhibit also details the market segment INPUT believes provides the best fit for Bechtel in the information services market--professional services.

- While other market segments may also be attractive for Bechtel, INPUT believes the best fit is in professional services. Bechtel's processing/network service activity and software products are supportive, but the primary mission

EXHIBIT II-1

COMPUTER AND COMMUNICATIONS PROFESSIONAL SERVICES

EPCM						Computer P.S.		Operation and Plant Maintenance					
Conceptual Design	Project Manage-ment	Enginering	Procure-ment	Construc-tion	Start-up	Integra-tion	Operation	Staffing	Operation	Mainte-nance	Admin. & Control	Expansion	Project Manage-ment

Computer Professional Services																			
Integration												Operations							
		Software				Hardware			Project Management										
Feas. Study	System Design	Select	Develop Modify Enhance	Docu-ment	Test	Computer Select	Comm. Select	Integrate H/W,S/W & Comm. Equipment	Schedule Control	Cost Control	Client Train-ing	System Install	Staffing	Opera-tion	Hardware/ Software Maint.	Supplies Provision	Admin. & Control	Proc. Devel./ Doc.	Client Train-ing

should be in professional services which leverages Bechtel's substantial capabilities in the most effective manner.

- For purposes of this analysis the professional services market is further segmented as follows:

  - Systems design (general and/or detailed).

  - Third-party software.

  - Software selection and/or development.

  - Evaluation and selection of computer and communications equipment (hardware).

  - Hardware/software integration and testing.

  - Documentation and training.

  - Hardware/software maintenance.

  - Project management.

  - Following system implementation, facilities management (the level varies from partial to complete operation of the system).

- These projects typically involve vendor-provided systems, management, and/or maintenance for a multi-year period. Some cases will include a turnover to the customer after the system is operational. This integration, with a turnover, is most common in the private (commercial) sector. In other cases the project results in a long-term facilities management-type contract.

- Driving forces in the information services market include:

- Management recognition that a competitive edge can be lost if automation is not adopted and updated to support the heart of the business in innovative ways.

- The changing competitive structure of many U.S. industries that requires faster new product development cycles, a higher degree of product-embedded technology, and closer operational relationships with both suppliers and customers.

- The existence of old, but critical, systems which are fragmented and incomplete, setting the stage for a "new generation" implementation of total-solution approaches that are very complex and often require the integration of data, text, communications, and images.

- The complexity of the systems requirements which must deal with incompatability of hardware, software, and networks. The lack of standards creates further difficulty in trying to satisfy users' requirements.

• The net result is growing user comfort with the use of professional services contracts for designing and developing the required solution. The federal government has traditionally been the leader in terms of willingness to undertake this approach to procuring information systems solutions.

  - The federal government sector of the target market recommended for Bechtel currently overshadows the commercial market in terms of both size and years of customer/vendor experience.

  - However, by 1988 the commercial market will begin to overtake the federal sector in terms of size. By 1991 the commercial segment will be 50% larger than the federal government portion. INPUT projects this segment will grow at an average annual rate of 38% over the next five years.

- The following sections of this Executive Overview will provide analyses of the federal and commercial markets.

B. FEDERAL GOVERNMENT MARKET ANALYSIS

- The entire range of professional services in the federal government is expected to increase as information services requirements increase at a faster pace than the federal budget. Some contributing factors are:

  - Most of the federal government computer staff are committed to the operation of existing systems and equipment. The high percentage of custom applications in the inventory requires an inordinate amount of dedicated maintenance.

  - Major upgrades and replacements of obsolete or undersized data processing resources require the use of contractor personnel to supplement federal staff.

  - New starts involving automation of data processing functions currently performed manually or with disparate semiautomated facilities are being designed, implemented, and initially operated by contractors.

  - Deficit spending controls will limit individual agencies' abilities to acquire additional computer systems personnel or provide adequate and competitive salaries to retain existing personnel.

  - These and other factors are creating excellent opportunities for professional services vendors.

- The federal government target market has been steadily increasing in response to several initiatives:

  - Under the guidance of OMB and the Congress, the agencies are moving rapidly to improve information resources that will provide enhanced levels of service to the public, Congress, and the executive branch.

  - With maintenance of custom software increasing to 70% of life cycle cost, there is an urgent need to both improve software and provide automated/more productive software support and maintenance methodologies.

  - GAO and GSA are emphasizing increased use of commercial products, both hardware and software, for improved economy and ease of repair and maintenance. Since the alternative is "custom" development, the motivation is clearly cost reduction-oriented.

  - The unpredicted installation delays and escalating implementation costs of past data processing systems have led to contractual procedures that require the contractor to share the implementation risk by instituting risk containment methods.

  - For the same reasons listed above, agencies are being pressed to use more contractor personnel for the various aspects of integration from initial design and feasibility studies to post-installation operation, software improvements, and maintenance.

- With some exceptions at large NASA and Department of Energy facilities, the average level of contract value is different for military and civilian activities:

  - Defense contracts vary from $5-20 million. Proposed consolidation of contracts at larger laboratories and centers could reach $75-100 million.

- Civilian agency contracts generally vary between $1 million and $5 million. NASA contracts have reached $25 million at the Kennedy and Johnson Centers, and Energy contracts have gone as high as $50 million at Oak Ridge (TN).

- Despite the larger values of Defense contracts, civilian agencies have been contracting more operational FM services since 1984 and are expected to continue to do so through 1990.

- The federal market appears to be heavily oriented toward replacement of general purpose systems over the next five years, excluding the very large FAA Advanced (Air Traffic Control) Automation System valued currently at $12 billion.

  - The leading application planned is information analysis, with about 28% of the funding.

  - Administration is the next most significant system application with 16% of the funding, and human resources is expected to reach 10%.

  - Office automation, management analyses, and graphics applications are each expected to use 9% of the funding.

  - Despite the emphasis on upgraded logistics systems, current projections indicate only 8% of funding to be committed to this. The Defense Department CALS (Computer Aided Logistics Systems) initiative may increase the proportion of funding.

  - Accounting and other applications, including scientific and engineering, will collectively spend the remaining 10% of projected funding.

- The relative ranking of vendors varies with the award of each major program. Among the leaders are both hardware and systems vendors, including GM/EDS, Martin Marietta, Unisys, Science Applications International, Control Data Corporation, Computer Sciences Corporation, IBM, and Ford Aerospace

- IBM was also a major supplier of hardware to EDS, CSC, PRC, and Ford Aerospace.

- Others like the "Big 8" accounting firms and management consulting firms have been gaining share in the federal market.

- Issues that are shaping the market include competitive forces, regulatory trends, equipment inventory, and standardization.

  - The federal acquisition regulations for information resources has become increasingly stringent in efforts to block "buy-ins," assure maximum competition, and seek lowest practical costs.

  - Upgrades are intended to maximize the useful life of installed data processing equipment. Agencies try to avoid acquisition of incompatible components or the need to completely replace software suites.

  - Standardization comes slowly in the federal government, especially in data processing and communications. Civil agencies frequently allow industry to recommend workable interfaces while Defense agencies tend to be less flexible in consideration of their extensive in-place inventory.

  - The Competition in Contract Act and creation of the General Services Board of Contract Appeals as an alternative to GAO for protests has been viewed as a two-edged sword by both contractors and agencies.

- While the protests are resolved earlier, there is wider latitude for initiating protests and the prospect of more protests due to records unearthed by the "discovery" procedure.

- The information developed for the study demonstrates an appealing advantage for Bechtel in that the opportunities identified are not currently being pursued by other Bechtel business units. These opportunities are in addition to the advanced technology, real-time data acquisition, and other projects normally pursued by BNI (AT/R&D).

- Bechtel's BNI presence in the high technology markets should be an additional plus and very supportive of the information services market opportunities identified in this report.

C. COMMERICAL MARKET ANALYSIS

- The major opportunity for Bechtel in the commercial market is the complex project segment of the professional services market. This segment is one of the fastest growing and most dynamic in the entire information services industry. With a 1986 base of $600 million and a projected five-year average annual growth rate of 38%, the market will exceed $ 3 billion by 1991.

D. MARKET FACTORS

- It is only within the past five years that industrial organizations have begun to embrace the use of outside services to address complex information services projects. Unlike the federal market, the commercial market is still in its infancy for these complex projects.

- The impressive track records established by vendors serving the federal government during the past 15 years have finally provided a credibility that corporate executives are now beginning to accept.

- The urgency of enhanced industrial productivity has surged just as vendors are able to demonstrate success at assuming major computer systems implementation responsibility.

- The result is a well balanced demand and supply in the commercial market.

- When user expenditures for not only professional services but also hardware and software products are included, total revenues for the commercial market will exceed $1 billion in 1986 and grow to over $5 billion by 1991.

- While there are no dominant vendors in the target market, there are competitors who, in INPUT's opinion, have material or conceptual assets that could be leveraged to profitably exploit the opportunities in the commercial market. (In INPUT's opinion Bechtel has many assets that could be leveraged in this market.)

- Many vendors currently possess the basic assets on which to build a significant revenue stream from the target market. In the long run, however, a few large vendors will dominate both large- and medium-size opportunities.

  - These vendors will have made commitments to both establishing vendor relationships and developing or acquiring complex project management expertise. As they grow, they will attract even more vendors with distribution or subcontracting opportunities, further expanding their ability to claim the breadth of product/service offerings required by the customer.

- The major issue will be whether these larger vendors can overcome limitations in applications and industry experience that may accrue as they expand their base of experience.

- The remaining vendors should find opportunities in related applications or industries as they focus on areas of expertise. These vendors should also consider subcontracting to larger vendors. This will be a competitive situation, however, as the larger vendors will be attracted to new entrant vendors with advanced technical expertise as well as current vendors with applications or industry expertise.

E. CONTRACT EXAMPLES

- A sampling of recent commercial contracts are presented below.

1. EXAMPLES OF IBM ACTIVITY

- IBM's 5,500-employee Complex Systems Organization (CSO) located in Gaithersburg (MD) and Houston (TX) specializes in commercial FM integration. CSO has contracts with:

  - General Electric for integrated medical diagnostics using IBM mainframes as a central data base ($10 million).

  - United Airlines for a travel agency automation system based on S/370 mainframes and personal computers ($200 million).

  - Agway Stores for network applications for this supermarket chain ($14 million).

- In addition, IBM has recently received a letter of intent from Ford Motor Company ($300 million) for developing an office automation network with 30,000 workstations in a single network.

2. EXAMPLES OF GM/EDS ACTIVITIES

- GM/EDS has emerged as a major force in both government and commercial professional services. Examples of contracts obtained by EDS in the past 24 months include:

  - Unilever, the world's largest consumer goods company with $19 billion in revenues, is one of EDS' biggest FM sales. This ten-year contract calls for EDS to manage Unilever's joint main corporate offices in London and Rotterdam. Other EDS work includes the installation of one of the largest and most advanced private digital telecommunications networks in Europe.

  - Citicorp for an integrated brokerage accounting system with contracts involving IBM, AT&T, and Morgan Stanley ($15 million).

  - Federal Home Loan for a clearinghouse network for the 124 participating banks ($10 million).

  - Isuzu Motors for a worldwide data processing and telecommunications upgrade involving Isuzu locations in the U.S., Japan, and Europe.

  - K-Mart for installation of a 500-store point-of-sale system ($20 million).

3. EXAMPLES OF OTHER ACTIVITIES

- AT&T has a contract with the University of Southern California to develop a university communications voice/data network with fiber optics, linking 11,000 users in 185 buildings on 2 campuses ($22 million).

- Arthur Andersen has over $40 million of commercial FM business, mostly related to CIM.

- Northrup will soon let a Request for Proposal for the design, development, and installation of a fiber optic communications network designed to tie together engineers in buildings throughout the Los Angeles area.

F. BECHTEL-SPECIFIC RECOMMENDATIONS

- Based on INPUT's analysis of Bechtel capabilities and resources, Bechtel should be able to build a $250-300 million business in information services within five years.

- INPUT recommends the following steps be initiated in order to realize the potential for Bechtel in the information services marketplace.

1. SEGMENTS TO PURSUE

- INPUT recommends that Bechtel's primary strategic long-term thrust be the commercial market. This approach can be implemented in two stages:

  - Stage One: an initial thrust into the federal market for the purpose of gaining experience and image in a segment that is inherently more mature, stable, and predictable. This initial thrust should be maintained to take full advantage of Bechtel's presence in the federal market.

  - Stage Two: a major, long-term thrust into the commercial marketplace. The commercial market offers dramatic growth and a high degree of receptiveness to the strengths Bechtel can bring to this marketplace.

- When approaching the commercial segment, Bechtel is urged to stay alert to organizations that have the following characteristics as they tend to be most receptive to Bechtel:

  - The target industry's structure is changing significantly due to regulatory, competitive, or other major forces.

  - The information systems organization is competent and knowledgeable.

  - There is a history exists of use of outside services.

  - Systems considered for design and development projects are important in maintaining the firm's competitive edge or strategic direction.

- Examples of industries where these characteristics tend to currently appear frequently are:

  - Aerospace.

  - Energy.

  - Telecommunications.

  - Manufacturing.

  - Banking/finance.

- Should Bechtel elect to pursue the commercial market, one of these areas should be targeted. Successful vendors in this market will be very focused.

2. KEYS TO SUCCESS

- Success in performing these complex projects requires simultaneous excellence in the following areas:

  - Development of a sound area of expertise that can provide market differentiation.

  - High level of complex project management skills.

  - Technical expertise in multiple functions.

  - Publicly acknowledged credibility.

  - Effective teaming (to include risk sharing) with reliable and reputable subcontractors.

  - Excellent understanding of the competition, especially in the area of sizing opportunities, determining bidding strategies, and making pricing analyses and decisions.

  - Disciplined bid planning, pricing, and proposal preparation.

- Other guidelines include:

  - Reduce risk by bidding feasibility studies first.

  - Consider carefully whether to be a prime or a subcontractor on the initial contract.

  - Select target prospects carefully (bidding is costly and customer satisfaction is paramount, especially with initial customers).

- Ascertain that the critical personnel skills are available.

- Focus on technical consulting and project management skills as these capabilities are highly valued by customers.

- Target senior executives in the prospect organization, not just the information systems managers.

- Propose project phases to reduce risk.

- Generally speaking, the commercial marketplace is more "opportunistic" at this time due to its newness. In contrast, the federal market is more established and thus requires less market planning.

3. ENTRY PLAN

- Bechtel's Stage One entry to the federal government market depends on current legacies in this market. Given Bechtel's reputation, the entry level contracts to pursue should be in the $5-25 million range.

  - Key factors in government awards in this market are image, credentials, price, policies, and fiscal viability. Also required to be demonstrated are an understanding of the client agency's operating requirement, contract authority ground rules, and the political environment of the contract.

  - Bechtel may need to develop teaming selections with smaller companies that have identified skills in key technical areas such as software, equipment, and functional operations unique to the agency's mission.

  - Opportunities should be selected that are not due to release RFPs before mid-calendar year 1987 to allow time to contact the client, define the problems, and establish a primary strategy.

4. TACTICS

- The following are general tactical guidelines for Bechtel to begin building a sales program for the federal sector. The refinement and implementation of the strategy and these tactics should be the responsibility of a senior Bechtel sales executive based in Washington D.C.

  - Client contact should be made with the program manager, key user technical representatives, agency management, and the contract officer in order to:

    . Determine the viability of opportunity (is it funded and likely to stay that way?).

    . Understand the agency's contracting process.

    . Assess technical biases toward a specific vendor's equipment, software, and subject specialization.

    . Develop rapport with agency management to gain acceptance.

    . Identify key technical requirements and institute a pre-bid methodology and discipline.

    . Identify in-house skills and involve them in pre-proposal evaluation.

    . Identify needed outside skills and develop pre-bid agreements.

    . Designate proposal and project management, including team members, early on wherever possible.

- Continue interaction with agency personnel.

- Identify likely competitors and rank them by technical, pricing, and management capability and by prior/current agency relationships. Analyze likely proposal strategies where possible.

- Bid at least one opportunity with the target agency to establish that agency's proposal evaluation procedures, point scoring, and selection process. Request a debriefing to show interest and increase understanding of the evaluation process.

- Likely agency candidates will vary according to the type of professional services opportunities:

  - Recompetitions by NASA will provide the best chance to replace an incumbent as the emphasis increases for mission contracting.

  - Standalone opportunities with small agencies are prone to independent award if Bechtel can demonstrate an understanding of the agency's needs and desired resources.

  - The very large opportunities are not recommended as entry prospects; the competition will have a strong track record and several years of following agency development of the opportunity. Exceptions do occur, however, as with the GM/EDS defeat of CSC for VIABLE based on use of prior internal knowledge of Army proposal evaluation and contract procedures.

5. STAFFING

- INPUT has recommended that Bechtel launch its initial effort into the federal sector. One alternative is to create a full-scale team of 20-30 professionals dedicated to establishing a presence. At the other end of the spectrum is the

alternative that INPUT recommends, which is to launch a "probe" in the Washington area.

- The mechanics of such a "probe" are as follows:

  - Recruit a senior sales executive to take over this "ground floor" opportunity. The individual must be experienced in the federal market and capable of finding a "quick hit" opportunity with minimal support.

  - Identify and begin initial training of a Bechtel "jet squad" that will be capable of quickly becoming the proposal team to support the sales executive. Once the sales executive has identified and qualified one to three good fits for Bechtel's entry, dedicated support will be needed to demonstrate Bechtel's potential to the agency.

  - Subsequent to the initial success in the federal sector, Bechtel can determine the level of ongoing effort warranted in establishing a presence in the federal market. This activity will also be a "test platform" for launching the commercial effort.

- This concludes the Executive Overview of the report. As it shows, the information services market offers a superb opportunity that fits Bechtel's strengths very well. Bechtel should move quickly to exploit this advantage.

III INFORMATION SERVICES MARKET OVERVIEW

III INFORMATION SERVICES MARKET OVERVIEW

A. MARKET SIZE AND COMPONENTS

- The information services market reached nearly $55 billion in user expenditures in 1986. INPUT is forecasting the market to grow at an average annual rate of 18% for the next five years, resulting in a $123 billion market by 1991.

- The information services market consists of four major segments. These segments and their size and projected growth are:

Market Segment	1986 Size ($ Billions)	1991 Size ($ Billions)	Average Annual Growth Rate
Processing/Network Services	18.2	34.0	13%
Software Products	15.8	43.1	22%
Professional Services	12.5	28.7	18%
Turnkey Systems	8.2	17.5	16%
Total Information Services	54.7	123.3	18%

- The recommended target markets are primarily contained within the professional services area. The size and growth of these markets will be presented and analyzed in subsequent sections.

- The major market participants in these four segments of the information services market are listed in Appendix A.

- While many new companies have emerged and prospered in the information services industry, the dominant players continue to be the large, well capitalized organizations. Some, like ADP, CSC, PRC, and Computer Associates, have grown as independents. Many have developed out of large companies such as Boeing and General Electric whose primary business is not information services.

- Another characteristic of the industry is that acquisition has played a key role in the growth of many of the market leaders. ADP, CSC, Computer Associates, MSA, Sterling Software, Dun & Bradstreet, McDonnell Douglas, and many others have made multiple acquisitions a part of their market development strategy.

- Bechtel's experience with the UCCEL activity and other contracts such as the Elk Hills and SEC projects will contribute to Bechtel's ability to succeed in the information services industry. However, the opportunity INPUT sees for Bechtel is "pure" information services without the other components of a typical Bechtel project.

- Exhibit III-1 provides a graphic representation of a "typical" Bechtel project with its "typical" information services component, a subset of a traditional Bechtel job. The exhibit also details the market segment INPUT believes provides the best fit for Bechtel in the information services market--professional services.

- While other market segments may also be attractive for Bechtel, INPUT believes professional services is the best fit. Bechtel's processing/network service activity and software products are supportive, but the primary mission should be in professional services and specifically in the opportunities that leverage Bechtel's substantial capabilities in the most effective manner.

EXHIBIT III-1

COMPUTER AND COMMUNICATIONS FACILITIES SERVICES

EPCM						Computer F.M.		Operation and Plant Maintenance					
Conceptual Design	Project Manage-ment	Engi-neering	Procure-ment	Construc-tion	Start-up	Integra-tion	Operation	Staffing	Operation	Mainte-nance	Admin. & Control	Expansion	Project Manage-ment

Computer Facilities Management																			
Integration												Operations							
		Software				Hardware			Project Management										
Feas. Study	System Design	Select	Develop Modify Enhance	Docu-ment	Test	Computer Select	Comm. Select	Integrate H/W,S/W & Comm. Equipment	Schedule Control	Cost Control	Client Train-ing	System Install	Staffing	Opera-tion	Hardware/ Software Maint.	Supplies Provision	Admin. & Control	Proc. Devel./ Doc.	Client Train-ing

B. FACILITIES MANAGEMENT MARKET OVERVIEW

1. MARKET CHARACTERISTICS

- The market segment that presents the best opportunity is professional services. Further, the facilities management portion provides a very focused market approach.

- The facilities management market is divided into two key segments:

  - Operational facilities management (OFM).

  - Facilities management integration (FMI).

a. Operational Facilities Management

- Operational facilities management (OFM) occurs when the vendor has a multi-year contract for managerial control over the day-to-day running of the customer's computer facilities. The computer and communications hardware can be owned by the customer or the vendor.

- The type of operational FM where the vendor owns as well as operates the hardware is roughly three times the client-owned, vendor-operated segment. Within this vendor-owned hardware OFM market, the bulk of the user expenditures are within the commercial segment with banking/finance, insurance, and medical comprising roughly two-thirds of the total.

- INPUT does not recommend that Bechtel consider OFM as a major thrust. The OFM area should be treated as an "opportunity" market, meaning that if Bechtel can identify specific opportunities to bid, especially if they offer downstream FM integration potential, then these areas can be worthwhile, both in terms of immediate revenue and increased market presence.

- In contrast, the FM integration marketplace offers a major opportunity which INPUT recommends Bechtel pursue aggressively. FM integration is discussed in more detail below.

b. Facilities Management Integration

- Computer and communications facilities management integration (FM integration) is a more expansive service than OFM in that the contractor provides all or some of the following services in support of an information processing activity:

  - Systems design (general and/or detailed).
  - Third-party software.
  - Software selection and/or development.
  - Evaluation and selection of computer and communications equipment (hardware).
  - Hardware/software integration and testing.
  - Documentation and training.
  - Hardware/software maintenance.
  - Project management.
  - Following system implementation, the level of operational facilities management varies from partial to complete OFM.

- FMI contracts typically involve vendor-provided systems, management, and/or maintenance for a multi-year period. In some cases FMI will include a turnover to the customer after the system is operational. This integration, with a turnover, is most common in the private (commercial) sector. In other cases the FMI project results in a long-term OFM-type contract.

- Appendix B provides a more detailed discussion of FM integration, its components, and its characteristics.

2. MARKET SIZE AND DRIVING FORCES

- The total facilities management market in 1986 exceeded $5 billion. By 1991 this market will more than double to nearly $12 billion, an average annual growth rate of 18%.

- The FM integration segment of the total FM market is one of the fastest growing and most dynamic markets in the entire information services industry. The FMI market will more than triple during the next five years, growing from a 1986 base of $1.5 billion to reach $5 billion in annual user expenditures by 1991, a 27% average annual growth rate.

- This INPUT forecast is only for the professional services component of facilities management integration. This amount is often no more than one-half of the total user expenditures of most FMI projects since some vendors also receive revenue from supplying other items, such as hardware, software products, etc.

- Driving forces for the FMI market include:

  - Management recognition that a competitive edge can be lost if automation is not adopted and updated to support the heart of the business in innovative ways.

- The changing competitive structure of many U.S. industries that requires faster new product development cycles, a higher degree of product-embedded technology, and closer operational relationships with both suppliers and customers.

- The existence of old, but critical, systems which are fragmented and incomplete, setting the stage for a "new generation" implementation of total solution approaches that are very complex and often require the integration of data, text, communications, and images.

- The complexity of the systems requirements which must deal with incompatibility of hardware, software, and networks. The lack of standards creates further difficulty in trying to satisfy users' requirements.

• The net result is growing user comfort with the concept of FMI. The federal government has traditionally been the leader in terms of willingness to undertake this approach to procuring information systems solutions.

- The federal government sector, with about 60% of the FMI market, currently overshadows the commercial market in terms of both size and years of customer-vendor experience. From a base of $900 million in 1986, the federal market will expand to nearly $2 billion by 1991, an annual growth rate of 16%.

- However, by 1988 the commercial market will begin to overtake the federal sector in terms of size. By 1991 the commercial segment will be 50% larger than the federal government portion. INPUT projects this segment will grow at an average annual rate of 38% over the next five years.

• The operational FM segment of the total FM market will continue its steady growth of 8-9% and will exceed $6 billion by 1991. Targets of opportunity in

the OFM market will become available to Bechtel. The recommended targets are those that will allow Bechtel to penetrate a new agency or industry with the strategic purpose of developing the FMI portion of the target agency or industry.

- The main focus of OFM will continue to be on the federal government and on service-oriented, regulated markets in the commercial area, such as banking/finance and insurance.

- Some further development is also expected in the state and local sectors, especially in those areas where the federal government provides all or some of the funding.

- The next two sections will provide an analysis of the federal and commercial markets.

IV FEDERAL GOVERNMENT FACILITIES MANAGEMENT MARKET ANALYSIS

IV FEDERAL GOVERNMENT FACILITIES MANAGEMENT MARKET ANALYSIS

A. OVERVIEW

- The federal government information services-based FM market exists for nearly all of the same reasons as the commercial market--convenience, staffing, indeterminate life cycle, flexibility, and an immediate need for system solutions.

- The federal government FM contracts and opportunities cover a wide range of facility control, management, growth, and maintenance functions.

  - Facility control can vary from a computer system on one floor of a building to the entire computer facility plus all related services of a plant laboratory or center.

  - Management functions range from cooperative resources scheduling with the agency to total support for a mission, function, or test, including staffing, training (of both employees and client personnel), and staff scheduling.

  - Growth responsibility can vary from periodic audits of government resources with recommended improvements to implementing equipment and software upgrades and replacements, including a completely separate staff for technical services.

- Maintenance duties range from routine software maintenance and hardware diagnostics to complete responsibility including repair and replacement of defective components and enhancement releases for software programs.

- FM contractors with full facility control and growth responsibilities function as FM integration contractors for system expansions including equipment replacements. Hardware acquisition is separately treated in the federal government market because of widely varying procurement procedures.

  - Equipment is provided in the overall price of complete systems and prime contracts for custom systems.

  - Equipment may also be acquired separately by contract when agencies serve as the prime contractor or when a contract calls for adding equipment to an existing facility.

  - For additional information, see Appendix C, Federal Government FM Market.

B. MARKET FACTORS

- The entire range of professional services in the federal government is expected to increase as information services requirements increase at a faster pace than the federal budget. Some contributing factors are:

  - Most of the federal government computer staff are committed to the operation of existing systems and equipment. The high percentage of custom applications in the inventory requires an inordinate amount of dedicated maintenance.

- Major upgrades and replacements of obsolete or undersized data processing resources require the use of contractor personnel to supplement federal staff.

- New starts involving automation of data processing functions currently performed manually or with disparate semiautomated facilities are being designed, implemented, and initially operated by contractors.

- Deficit spending controls will limit individual agencies' abilities to acquire additional computer systems personnel or provide adequate and competitive salaries to retain existing personnel.

- These and other factors are creating excellent opportunities for professional services vendors.

- Facility management opportunities, including the recompetition of existing contracts, are moving away from specified labor mixes to mission support under contractor control. Other factors affecting FM opportunities are discussed in Appendix C.

- The federal government FM integration market has been steadily increasing in response to several initiatives:

  - Under the guidance of OMB and the Congress, the agencies are moving rapidly toward improved information resources that will provide enhanced levels of service to the public, Congress, and the executive branch.

  - With maintenance of custom software increasing to 70% of life cycle cost, there is an urgent need to both improve software and provide automated/more productive software support and maintenance methodologies.

- GAO and GSA are emphasizing increased use of commercial products, both hardware and software, for improved economy and ease of repair and maintenance. Since the alternative is "custom" development, the motivation is clearly cost reduction-oriented.

- The unpredicted installation delays and escalating implementation costs of past data processing systems have led to contractual procedures that require the contractor to share the implementation risk by instituting risk containment methods.

- For the same reasons listed above, agencies are being pressed to use more contractor personnel for the various aspects of FM integration from initial design and feasibility studies to post-installation operation, software improvements, and maintenance.

C. MARKET SIZE/VENDOR ACTIVITY

- The total federal FM market, including hardware expenditures, is nearing $3 billion in fiscal 1986. The federal OFM segment exceeded $900 million in fiscal 1986 and is projected to grow at an average annual rate of 8% to reach $1.4 billion by 1991. The major activity areas are administrative and laboratory support.

  - Administrative support in many agencies is characterized by inadequate staff levels and frequent requests for special studies or extended efforts.

  - Laboratory and engineering center data processing support tends to be erratic with workload peaks and valleys related to experimental efforts that are nearly impossible to schedule with fixed federal staffs.

- Contractors will be expected to operate new systems installed by FM integrators until the existing federal staff can be retrained and/or new personnel recruited.

- In the software and hardware maintenance support areas where continued improvements are planned, contractors may be expected to provide support for eight to ten years after the initial installation is completed.

- With some exceptions at large NASA and Department of Energy facilities, the average level of contract value is different for military and civilian activities.

  - Defense contracts vary from $5-20 million. Proposed consolidation of contracts at larger laboratories and centers could reach $75-100 million.

  - Civilian agency contracts generally vary between $1 million and $5 million. NASA contracts have reached $25 million at the Kennedy and Johnson Centers, and Energy contracts have gone as high as $50 million at Oak Ridge (TN).

  - Despite the larger values of Defense contracts, civilian agencies have been contracting more operational FM services since 1984 and are expected to continue to do so through 1990.

- Some of the larger operational FM vendors are Computer Sciences Corporation, GM/EDS, Planning Research Corporation, Martin Marietta, Lockheed, and Boeing Computer Services.

- The total federal FM integration market reached $2 billion in fiscal 1986 and is projected to grow at an average annual rate of 16%.

- The largest segment of the market is professional services with expenditures of $800 million in 1986. This figure does not include operational facilities management, maintenance beyond the warranty periods, and labor for custom software development.

- About $600 million of complete systems were acquired in 1986. The value-added FM integration and adaptation of software is included in this expenditure.

- Slightly more than $600 million of equipment was acquired in 1986. The figure includes mainframes, minicomputers, workstations, and communications and peripheral devices.

• The federal FM integration market appears to be heavily oriented toward replacement of general purpose systems over the next five years, excluding the very large FAA Advanced (Air Traffic Control) Automation System, currently valued at $12 billion.

- The leading FM integration application planned is information analysis, with about 28% of the funding.

- Administration is the next most significant system application with 16% of the funding, and human resources is expected to reach 10%.

- Office automation, management analyses, and graphics applications are each expected to use 9% of the funding.

- Despite the emphasis on upgraded logistics systems, current projections indicate only 8% of funding to be committed to this. The Defense Department CALS (Computer Aided Logistics Systems) initiative may increase the proportion of funding.

- Accounting and other applications, including scientific and engineering, will collectively spend the remaining 10% of projected funding.

- The relative ranking of FM integration vendors varies with the award of each major program. Among the leaders are both hardware and systems vendors including GM/EDS, Martin Marietta, Unisys, Science Applications International, Control Data Corporation, Computer Sciences Corporation, IBM, and Ford Aerospace.

- IBM was also a major supplier of hardware to EDS, CSC, PRC, and Ford Aerospace.

- Others like the "Big 8" accounting firms and management consulting firms have been gaining share in the federal market.

- Issues that are shaping the market include competitive forces, regulatory trends, equipment inventory, and standardization.

  - Competition is increasing at all levels of contracting as large aerospace and hardware firms move into the high technology information resources market. Competitive forces demand careful attention to market factors.

    - Pricing has continued to be a major factor. Fixed-price risk containment bids are being offered by the leaders.

    - Pre-solicitation intelligence has become very important in guiding bidding strategy, both technical and price, and emphasizing the necessity of reflecting the client's needs in the proposed solution.

    - Pre-bid formation of teams and primary suppliers is viewed by agency evaluators as essential to demonstrating the ability of

the contractor to fully comply with schedule and cost constraints.

- The federal acquisition regulations for information resources has become increasingly stringent in efforts to block "buy-ins," assure maximum competition, and seek lowest practical costs.

- Upgrades are intended to maximize the useful life of installed data processing equipment. Agencies try to avoid acquisition of incompatible components or the need to completely replace software suites. Clones and plug-compatibles that cost less are frequently offered in price-sensitive bids.

- Standardization comes slowly in the federal government, especially in data processing and communications. Civil agencies frequently allow industry to recommend workable interfaces while defense agencies tend to be less flexible in consideration of their extensive in-place inventory.

- The Competition in Contract Act and creation of the General Services Board of Contract Appeals as an alternative to GAO for protests has been viewed as a two-edged sword by both contractors and agencies. While the protests are resolved earlier, there is wider latitude for initiating protests and the prospect of more protests due to records unearthed by the "discovery" procedure.

- Within the federal sector there are roughly three categories of opportunities--multi-year operational FM of existing resources, FM integration projects with limited post-installation support, and FM integration projects with long-term operational FM prospects. These three areas are discussed in detail in Appendix D. Appendix D also contains specific data on 13 competitive opportunities of interest to Bechtel.

- The information in Appendix D demonstrates an appealing advantage for Bechtel in that the opportunities identified are not currently being pursued by other Bechtel business units. These opportunities are in addition to the advanced technology, real time data acquisition, and other projects normally pursued by BNI (AT/R&D).

- Bechtel's BNI presence in the high technology markets should be an additional plus and very supportive of the information services market opportunities identified in this report.

V COMMERCIAL FACILITIES MANAGEMENT MARKET ANALYSIS

V COMMERCIAL FACILITIES MANAGEMENT MARKET ANALYSIS

A. OVERVIEW

- The commercial facilities management marketplace will more than quadruple during the next five years, going from a 1986 base of $800 million to $3.4 billion in 1991. This market is segmented the same as the federal market into operational FM and FM integration.

- Operational FM comprises 25% of current user expenditures for commercial facilities management. This segment will account for less than 10% of user expenditures by 1991.

- The major opportunity is the FM integration segment. This segment is one of the fastest growing and most dynamic in the entire information services industry. With a 1986 base of $600 million and a projected five-year average annual growth rate of 38%, this market will exceed $ 3 billion by 1991. The remainder of this chapter will profile this opportunity.

B. MARKET FACTORS

- It is only within the past five years that industrial organizations have begun to embrace commercial facilities management integration. Unlike the federal market, the commercial FM integration market is still in its infancy.

- The impressive track records established by vendors serving the federal government during the past 15 years have finally provided a credibility that corporate executives are now beginning to accept.

- The urgency of enhanced industrial productivity has surged just as vendors are able to demonstrate success at assuming major computer systems implementation responsibility.

- The result is a well balanced demand and supply for commercial FM integration.

- When user expenditures for not only professional services but also hardware and software products is included, total revenues for commercial facilities management integration will exceed $1 billion in 1986 and grow to over $5 billion by 1991.

- INPUT estimates that the high appeal of commercial FMI will by 1991 result in a doubling of the number of large-scale complex information systems projects awarded to external vendors.

- When evaluating commercial FMI contractors, the relative importance of vendor selection criteria generally are:

Criteria	Importance
Application knowledge	High
Integration experience	High
Project management skill	High
Network design/implementation	Medium
Industry experience	Medium
Support reputation	Medium
Breadth of offering	Medium

- The importance attached to specific criteria will, of course, vary depending on the characteristics of a given organization.

  - Sophisticated customers will tend more toward adequacy of proposed solutions and less toward specific products. They look carefully at proposed technical solutions and the vendor's ability to deliver the solution by gauging the vendor's reputation or evidence of established relationships with third-party vendors.

  - There is also a large base of users who state a preference for specific hardware and/or software as a result of product experience and/or a desire to standardize corporatewide on a single brand for simplification or maintenance and interface.

- In addition, clients attach importance to the extent of risk containment measures offered by the vendor, such as:

  - Experience of proposed staff.

  - Project control procedures.

  - Type of contract proposed.

- In general, it appears the dynamics in the marketplace encourage the further development of the FM integration concept.

C. VENDOR ANALYSIS

1. CURRENT AND FUTURE FMI VENDORS

- While there are no dominant vendors in the commercial FMI market, there are competitors who, in INPUT's opinion, have material or conceptual assets that could be leveraged to profitably exploit the opportunities in the commercial FMI market. (In INPUT's opinion, Bechtel has many assets that could be leveraged in this market.)

- Current competitors are listed in Appendix E, Competitors in Commercial FM.

2. FUTURE CHANGES IN THE VENDOR COMMUNITY

- As noted above, many vendors currently possess the basic assets on which to build a significant revenue stream from FM integration. In the long run, however, a few large vendors will dominate both large- and medium-sized opportunities.

  - These vendors will have made commitments to both establishing vendor relationships and developing or acquiring complex project management expertise. As they grow, they will attract even more vendors with distribution or subcontracting opportunities, further expanding their ability to claim the breadth of product/service offerings required by the customer.

  - The major issue will be whether these larger vendors can overcome limitations in applications and industry experience that may accrue as they expand their base of experience.

- The remaining vendors should find opportunities in related applications or industries as they focus on areas of expertise. These vendors should also consider subcontracting to larger vendors. This will be a competitive situation, however, as the larger vendors will be attracted to new entrant vendors with advanced technical expertise as well as current vendors with applications or industry expertise.

D. CONTRACT EXAMPLES

- A sampling of recent commercial FM contracts are presented below.

1. EXAMPLES OF IBM ACTIVITY

- IBM's 5,500-employee Complex Systems Organization (CSO) located in Gaithersburg (MD) and Houston (TX) specializes in commercial FM integration. CSO has contracts with:

  - General Electric for integrated medical diagnostics using IBM mainframes as a central data base ($10 million).

  - United Airlines for a travel agency automation system based on S/370 mainframes and personal computers ($200 million).

  - Agway Stores for a network application for this supermarket chain ($14 million).

- In addition, IBM has recently received a letter of intent from Ford Motor Company ($300 million) for developing an office automation network with 30,000 workstations in a single network.

2. EXAMPLES OF CONTROL DATA ACTIVITIES

- CDC has contracts ranging in size from $5-20 million each with 27 power utilities worldwide for energy management systems. When delivered, these systems, which are CDC Cyber 180-based, will provide one or more of the following applications: monitoring and control, power applications, network analysis, forecasting, and scheduling. These contracts include hardware, customized software, communications, and training components. The average professional services contract is 25 person-years per contract. These contracts are the responsibility of CDC's Energy Management Systems Division. Customers CDC has signed include:

  - Pacific Gas and Electric (approximately $20 million). Signed in February 1986, this is CDC's largest energy management contract to date and incorporates all of the application areas mentioned above.

  - Bonneville Power Administration (over $10 million). The contract began in 1985 and is to be delivered in 1988. The focus is on a SCADA system related to power generation sources.

  - General Public Utilities/Metropolitan Edison/Public Service. This customer, which has responsibility for Three Mile Island, will receive CDC services similar to those provided to PG&E.

- CDC's Computer Integrated Manufacturing (CIM) Division is currently negotiating a large commercial FM contract that will involve not only CDC hardware but third-party vendors and "Big 8" consultants. CDC anticipates significantly more commercial FM integration work in the future.

3. EXAMPLES OF GM/EDS ACTIVITIES

- GM/EDS was one of the country's first commercial facilities management specialists and has now emerged as a major force in both government and

commercial FM. Examples of contracts obtained by EDS in the past 24 months include:

- Unilever, the world's largest consumer goods company with $19 billion in revenues, is one of EDS' biggest FM sales. This ten-year contract calls for EDS to manage Unilever's joint main corporate offices in London and Rotterdam. Other EDS work includes the installation of one of the largest and most advanced private digital telecommunications networks in Europe.

- Citicorp ($15 million): an integrated brokerage accounting system. Contracts involves IBM, AT&T, and Morgan Stanley.

- Federal Home Loan ($10 million): a clearinghouse network for the 124 participating banks.

- Isuzu Motors: worldwide data processing and telecommunications upgrade involving Isuzu locations in the U.S., Japan, and Europe.

- K-Mart ($20 million): installation of a 500-store point-of-sale system.

4. EXAMPLES OF OTHER ACTIVITIES

- AT&T has a contract with the University of Southern California to develop a university communications voice/data network with fiber optics, linking 11,000 users in 185 buildings on 2 campuses (contract value is $22 million).

- Arthur Andersen has over $40 million of commercial FM business, mostly related to CIM.

- Northrup will soon let a Request For Proposal for the design, development, and installation of a fiber optic communications network designed to tie together engineers in buildings throughout the Los Angeles area.

E. BECHTEL - FM MARKET PROFILE

- FM projects have widely varying degrees of requirements. Exhibit V-I profiles examples of characteristics of different types of projects and then provides a subjective match of Bechtel capabilities to those project requirements.

- INPUT's evaluation shows Bechtel ranks very high in two-thirds of the categories. With a dedicated program Bechtel should easily be able to rank very high in all of these criteria, an indication of the potential for Bechtel as a highly credible supplier.

EXHIBIT V-1

SAMPLE FACILITIES MANAGEMENT PROJECTS

TASK	GOVERNMENT			COMMERCIAL			BECHTEL CAPABILITY RATING*
	A	B	C	D	E	F	
FM Integration							
Project Management	X	X		X	X	X	5
Feasibility Studies	X			X			5
System Design	X	X		X			4
Software Develop/ Modify	X			X		X	3
Hardware Selection	X	X		X			3
Software Selection	X	X		X			2
Systems Testing	X	X		X	X	X	4
Documentation	X	X		X		X	3
Client Training	X	X		X		X	4
Operational FM							
Project Management	X		X		X		5
Hardware Operation	X		X		X		5
Procedures Documentation	X		X		X		4
Hardware Maintenance	X		X		X		N/A
Software Maintenance	X				X		4
Supplies Provision	X				X		5

*Rating Scale: 5 = Highest, 1 = Lowest.

A, B, C = Examples of Government Projects

D, E, F = Examples of Commercial Projects

VI BECHTEL-SPECIFIC RECOMMENDATIONS

VI BECHTEL-SPECIFIC RECOMMENDATIONS

- Based on INPUT's analysis of Bechtel capabilities and resources, Bechtel should be able to build a $250-300 million business in information services within five years.

- INPUT recommends the following steps be initiated in order to realize the potential for Bechtel in computer and communications FM.

A. SEGMENTS TO PURSUE

- INPUT recommends that Bechtel's primary strategic long-term thrust be the commercial facilities management market. This approach can be implemented in two stages:

  - Stage One: an initial thrust into the federal FM market for the purpose of gaining experience and image in a segment that is inherently more mature, stable, and predictable. This initial thrust should be maintained to take full advantage of Bechtel's presence in the federal market.

  - Stage Two: a major, long-term thrust into the commercial FM marketplace. Commercial FM offers both dramatic growth and a high degree of receptiveness to the strengths Bechtel can bring to this marketplace.

- When approaching the commercial segment, Bechtel is urged to stay alert to organizations that have the following characteristics as they tend to be most receptive to FM:

  - The target industry's structure is changing significantly due to regulatory, competitive, or other major forces.

  - The information systems organization is competent and knowledgeable.

  - A company history exists of use of outside services.

  - Systems considered for commercial FM are important to maintenance of the firm's competitive edge or strategic direction.

- Examples of industries where these characteristics tend to currently appear frequently are:

  - Aerospace.

  - Energy.

  - Telecommunications.

  - Manufacturing.

  - Banking/finance.

- Should Bechtel elect to pursue the commercial market, initially one of these sectors should be targetted. Successful vendors in this market will be very focused.

B. KEYS TO SUCCESS

- Success in the facilities management marketplace requires simultaneous excellence in the following areas:

  - Development of a sound area of expertise that can provide market differentiation.

  - High level of complex project management skills.

  - Technical expertise in multiple functions.

  - Publicly acknowledged credibility.

  - Effective teaming (to include risk sharing) with reliable and reputable subcontractors.

  - Excellent understanding of the competition, especially in the areas of sizing opportunities, determining bidding strategies, and making pricing analyses and decisions.

  - Disciplined bid planning, pricing, and proposal preparation.

- Other guidelines include:

  - Reduce risk by bidding feasibility studies first.

  - Consider carefully whether to be a prime or a subcontractor on the initial contract.

  - Select target prospects carefully (bidding is costly and customer satisfaction is paramount, especially with initial FM customers).

- Ascertain that the critical personnel skills are available.

- Focus on technical consulting and project management skills as these capabilities are highly valued by customers.

- Target senior executives in the prospect organization, not just the information systems managers.

- Propose project phases to reduce risk.

- Generally speaking, the commercial FM marketplace is more "opportunistic" at this time due to its newness. In contrast, the federal market is more established and thus requires less market planning.

C. ENTRY PLAN

1. STRATEGY

- Bechtel's Stage One entry to the federal government market depends on current legacies in this market. Given Bechtel's reputation, the entry level contracts to pursue should be in the $5-25 million range.

  - Key factors in government awards in this market are image, credentials, price, policies, and fiscal viability. Also required to be demonstrated are an understanding of the client agency's operating requirement, contract authority ground rules, and the political environment of the contract.

  - Bechtel may need to develop teaming selections with smaller companies that have identified skills in key technical areas such as

software, equipment, and functional operations unique to the agency's mission.

- Opportunities that are not due to release RFP's before mid-calendar year 1987 should be selected to allow time to contact the client to define the problems and establish a primary strategy.

2. TACTICS

- The following are general tactical guidelines for Bechtel to begin building a sales program for the federal sector. The refinement and implementation of the strategy and these tactics should be the responsibility of a senior Bechtel sales executive based in Washington D.C. (see next section on staffing).

  - Client contact should be made with the program manager, key user technical representatives, agency management, and the contract officer in order to:

    - Determine viability of opportunity (is it funded and likely to stay that way?).

    - Understand the agency's contracting process.

    - Assess technical biases toward a specific vendor's equipment, software, and subject specialization.

    - Develop rapport with agency management to gain acceptance.

    - Identify key technical requirements and institute a pre-bid methodology and discipline.

    - Identify in-house skills and involve them in pre-proposal evaluation.

- Identify needed outside skills and develop pre-bid agreements.

- Designate proposal and project management, including team members, early on wherever possible.

- Continue interaction with agency personnel.

- Identify likely competitors and rank them by technical, pricing and management capability and by prior/current agency relationships. Analyze likely proposal strategies where possible.

- Bid at least one opportunity with the target agency to establish that agency's proposal evaluation procedures, point scoring, and selection process. Request a debriefing to show interest and increase understanding of the evaluation process.

- Likely agency candidates will vary according to the type of professional services opportunities:

  - Recompetitions by NASA will provide the best chance to replace an incumbent as the emphasis increases for mission contracting.

  - Standalone opportunities with small agencies are prone to independent award if Bechtel can demonstrate an understanding of the agency's needs and desired resources.

  - The very large opportunities are not recommended as entry prospects; the competition will have a strong track record and several years of following agency development of the opportunity. Exceptions do occur, as with GM/EDS' defeat of CSC for VIABLE based on use of prior internal knowledge of Army proposal evaluation and contract procedures.

3. STAFFING

- INPUT has recommended that Bechtel launch its initial effort into the federal sector. One alternative is to create a full-scale team of 20-30 professionals dedicated to establishing a presence. At the other end of the spectrum is the alternative that INPUT recommends which is to launch a "probe" in the Washington area.

- The mechanics of such a "probe" are as follows:

  - Recruit a senior sales executive to take over this "ground floor" opportunity. The individual must be experienced in the federal market and capable of finding a "quick hit" opportunity with minimal support.

  - Identify and begin initial training of a Bechtel "jet squad" that will be capable of quickly becoming the proposal team to support the sales executive. Once the sales executive has identified and qualified one to three good fits for Bechtel's entry, dedicated support will be needed to demonstrate Bechtel's potential to the agency.

  - Subsequent to the initial success in the federal sector, Bechtel can determine the level of ongoing effort warranted in establishing a presence in the federal market. This activity will also be a "test platform" for launching the commercial effort.

D. VENDOR SELECTION CRITERIA

- INPUT's survey of federal agency professional services vendor selection criteria revealed some differences between civilian and defense agencies. These and other selection criteria are presented in Appendix F, Vendor Selection Criteria.

E. MARKET SIZING, 1987-1989

- Exhibit VI-1 shows the federal government marketplace that INPUT estimates is available to Bechtel over the next three years. More important, it demonstrates there are opportunities available in 1987 that will allow Bechtel to establish a presence in the market.

- There are sufficient opportunities to allow Bechtel to be selective in determining which opportunities to pursue on the way to realizing the $300-million potential. Exhibit VI-1 shows the federal opportunities. The commercial opportunities are analyzed in greater depth in INPUT's report Commercial Systems Integration Market, 1986-1991. Bechtel has multiple copies of this report for distribution to interested persons.

EXHIBIT VI-1

FEDERAL GOVERNMENT FACILITIES MANAGEMENT MARKET

Operational FM Opportunities:

FISCAL YEAR	TYPE	NUMBER	$ MILLIONS	
			TOTAL ANNUAL	TOTAL VALUE
1987	Recompete	150	$201	$804
	New	21	$38	$192
1988	Recompete	118	$247	$1,102
	New	43	$91	$424
1989	Recompete	88	$158	$554
	New	96	$214	$1,070

FM Integration Opportunities:

FISCAL YEAR	NUMBER	TOTAL VALUE ($ MILLIONS)
1987	19	$1,254
1988	16	$1,563
1989	11	$1,062

APPENDIX A: LEADING COMPETITORS

APPENDIX A: LEADING COMPETITORS

- The information services market consists of the following categories. Also shown are some of the leading vendors in each area.

  - In the processing/network services market (the business that Bechtel acquired from UCCEL fits in this segment of the industry) the key vendors are:

    . Automatic Data Processing (ADP).

    . McDonnell Douglas Information Systems.

    . General Electric Information Services (GEISCO).

    . Dun & Bradstreet Information Services.

    . TRW Information Services.

    . First Data Resources.

    . Shared Medical.

    . Telerate.

- Control Data Corporation.
- Lockheed Information Services.

- In the software products market the key vendors are:
  - IBM.
  - Computer Associates International.
  - Management Science America (MSA).
  - Cullinet.
  - McCormack & Dodge.
  - Candle Corporation.
  - Sterling Software.
  - VM Software.

- In the turnkey systems market key vendors include:
  - Intergraph.
  - Computervision.
  - Gould.
  - Triad Systems.
  - Reynolds and Reynolds.

- In the professional services market the key vendors are:
  - Computer Sciences Corporation (CSC).
  - GM/EDS.
  - Boeing Computer Services (BCS).
  - Arthur Andersen.
  - Unisys (Burroughs/Sperry).
  - Martin Marietta Data Systems.
  - Planning Research Corporation (PRC).
  - Computer Task Group.
  - IBM.
  - Logicon.
  - BDM International.

APPENDIX B: FM INTEGRATION

APPENDIX B: FM INTEGRATION

- FM integration is the assumption by the vendor of "total solution" responsibility for the creation and operation of a complex computer-based information system. The general characteristics of FMI are:

  - Single vendor responsible for delivery of a total solution.
  - User expenditure per project of $5 million or more.
  - Multi-year effort and contract period.
  - Transparent subcontractors.
  - Demanding project management.
  - Selection and acquisition of hardware/software.
  - Strategically significant to client.
  - Significant custom software development.
  - May include a substantial communications network component.
  - Sharing or total transfer of risk for successful system development to the vendor.

- Information systems users are often attracted to FMI for reasons such as the desire to:

  - Meet business objectives rapidly.

  - Reduce the risk of systems development.

  - "Acquire" project management skills.

  - Integrate fragmented systems.

  - Save costs over internally developed solutions.

  - Use new technology to achieve more cost-effective solutions.

- The FMI provider's role is to assume primary responsibility for developing and delivering an information systems solution that solves the customer's stated problem.

- In a slightly more detailed view, the tasks that are frequently included in the FMI contract are:

  - Feasibility and trade-off studies.

  - Project management, tracking, and reporting.

  - Systems design.

  - Selection/configuration of hardware and network.

  - Selection and sometimes modification of systems software.

- Selection/modification or development of applications software.
- Installation of hardware and software.
- Testing and demonstration of system.
- Documentation.
- Client staff training.
- Provision of data processing supplies.
- Operation and maintenance of hardware and software.

• The FMI vendor's revenue sources are typically one or more of the following:

- Project management fees.
- Professional services such as consulting, systems design, software development, and training.
- Markups from subcontractors.

APPENDIX C: FEDERAL GOVERNMENT FM MARKET

APPENDIX C: FEDERAL GOVERNMENT FM MARKET

- As discussed in the body of the report, there are two primary types of OFM services determined by ownership of the computer equipment in the federal government sector, called COCO and GOCO:

  - COCO (contractor-owned, contractor-operated) are information resources leased by federal agencies by time or facility to provide data processing and/or data base services.

  - GOCO (government-owned, contractor-operated) are information resources, frequently including the site(s) with the equipment owned or leased by federal agencies, where the performance and management of data processing functions are provided by a vendor under contract.

- The federal FM integration market includes providing complete systems and professional services to integrate hardware/software/network solutions.

  - Complete systems combine off-the-shelf solutions to specific data processing applications including all required computer and communications equipment and software. Some contracts call for turnover to government personnel; others will require the provider to operate the system on an operational facilities management basis.

  - FM integration services are required when the federal client desires a customized solution to the data processing functions needed. Federal FM integration opportunities can vary widely:

- At one end of the spectrum, the agency functions as a prime contractor, obtaining system design and integration services, hardware, installation, code conversion, and software development by separate contracts.

- At the other end, one vendor serves as prime contractor, separately acquiring equipment and services from other vendors in order to satisfy the total requirement.

- Hardware acquisition is separately treated in the federal government market and may be acquired through one of several procurement procedures:

  - Lease with purchase option after a specified period.

  - Lease-to-ownership-plan where the government takes title after a specified number of payments.

  - Acquisition through the GSA ADP equipment pool.

  - Direct acquisition by contract.

- Other factors affecting FM opportunities are:

  - Most federal FM contracts have a five-year life span. Some have a one-year base with four one-year options; others provide a three-year base with two one-year options. A few provide for two five-year terms.

  - Incumbency has been viewed as a key factor in retention of recompeted contracts in the past. However, GAO and OMB have pressured agencies to seek new contractors every five years to minimize price creep and most favored contractor status.

- Specified labor mix, also called labor-hour fixed-rate contracts, are usually task-order types, with the agency specifying schedules and level of effort. Under the current budget pressures, NASA and some DoD contracts have moved to mission contracting, with the level and amount of labor left to the discretion of the contractor to gain cost advantages.

- Under the earlier labor-hour contractors, price is/was the controlling selection factor. Contracts were won by vendors offering low overhead rates, minimum off-site management, and minimal fees (profit).

- When cost comparisons of current in-house data processing operations are performed under OMB Circular A-76, the winning vendor must offer at least a 20% reduction of the agency's lowest effective operating cost. Mission contracting permits vendors to bid fewer people with greater performance incentives.

• The agencies leading in the use of FM integration during the next five years will expend nearly 90% of the projected funding.

  - The Air Force will spend nearly half of the proposed DoD budget. The Office of the Secretary of Defense Agencies will spend 30-35% of the funds. The Navy and Army will spend the remainder. These figures exclude the Space Defense Initiative forecast.

  - The Treasury is expected to be the largest buyer among the civilian agencies from 1986 to 1991. HHS, HUD, and Commerce will be other large users. As noted earlier, this excludes the $12 billion FAA ATC program and the as-yet undefined portions of the NASA Space Station initiative.

APPENDIX D: FEDERAL GOVERNMENT OPPORTUNITIES

APPENDIX D: FEDERAL GOVERNMENT OPPORTUNITIES

- Within the federal government professional services FM market there are roughly three categories of opportunities--multi-year operational FM of existing resources, FM integration projects with limited post-installation support, and FM integration projects with long-term operational FM prospects.

- New multi-year operational FM opportunities are infrequent. Usually there are recompetitions at three- to five-year intervals at most installations which occur all year long.

- Typical of the recent recompetition of contracts in which the incumbent was replaced by a new vendor are the following activities:

  - NASA/National Space Technology Lab at Bay St. Louis (MS) - Provide technical support services, including data reduction at $8.4 million per year for five years, won by Planning Research Corporation from Computer Sciences Corporation which had held the contract for ten years.

  - Environmental Protection Agency/Research Triangle Park (NC) - System operation and technical support of the National Computer Center, won by SDC from CSC the incumbent for less than $6.8 million per year.

- Recompetition opportunities which have not yet been initiated, that is, the Request for Proposal has not been released, are:

  - Naval Weapons Center, China Lake (CA) - Data processing and related services with estimated annual expenditures $5-6 million for complete operational facility management of data processing functions of the laboratory. RFP to be released mid FY 1987, with bid due during the first quarter of FY 1988. CSC is the incumbent contractor (five-year contract) for the second time around. The current contract is expected to exceed $16 million since October 1983.

  - Department of Health and Human Services/National Center for Toxicological Research (NCTR), Jefferson (AR) - Data processing services, including systems programming on IBM 4341 and DEC VAX 750, 780, and 785 machines. Incumbent is Program Resources Incorporated for an average annual rate above $1 million. RFP will be released late in fiscal year 1987.

  - NASA Ames Research Center (ARC), Moffet Field (CA) - Master programming contract for one-year base and four one-year options. RFP to be released in mid FY 1987, with projected expenditures of about $12 million per year. Current level of effort is just over 200 man-years, supporting the flight research and technologies for military and commercial craft. ARC uses two IBM 4341s, Cray X-MP, and CYBER 205.

- A second area of federal opportunities are FM integration projects of significant technical interest or potential repeatability (for another agency), but with minimal prospect of post-installation (operational) facility management. The latter may be driven by laws requiring data processing being performed only by federal civil service personnel in agencies such as Social Security, Internal Revenue Service, and the Justice Department.

- Examples of recent program contracts without an operational FM component include:

  - Air Force Logistics Command/Maintenance Division, Wright Patterson Air Force Base (OH) - Maintenance job tracking system for the Air Logistics Centers (using non-stop fault tolerant computers) awarded to Ford Aerospace for $18.4 million.

  - Air Force Major Commands (acquired by the AF Computer Acquisition Center (MA)) - Combat Ammunition System - B (CAS-B) to provide data processing equipment and custom software for munitions functions, consisting of 97 host systems and 188 remote satellite clusters of terminals. Awarded to GM/EDS for $115 million (program includes eight years of maintenance support).

- Examples of upcoming FM integration opportunities with no expected operational facilities management include the following:

  - Army Information Systems Engineering Command, Ft. Belvoir (VA) - Army Corporate Data Base Project (ACDBP) with RFP release scheduled for mid fiscal 1987. Multi-phased project with about $20 million in early year's expenditures and about $4.5 million per year for five years. Involves provision of multi-level secure local area network and conversion into a knowledge-based system using artificial intelligence.

  - Treasury/Internal Revenue Service - Tax System Redesign - Washington, D.C. and ten IRS regional centers. Total redesign of the national automated tax processing system, including acquisition of hardware, software, and services with a 20-year

life cycle. RFP to be released in mid FY 1987. Current estimate of installed system is about $300 million with out-year prospects of $900 million including facility support contracting.

- The third category of professional services opportunities are those involving FM integration and operational FM. A wide range of projects are captive to the incumbent FM contractor and rarely advertised (particularly in Energy facilities operated by a contractor). Others clearly indicate post-installation (operational) FM as a required offering.

  - The largest current example of a combined FM integration and operational FM contract is the Army's VIABLE (Vertically Integrated Automated Base Logistics Environment) award to GM/EDS for $678 million (but currently valued at over $800 million). GM/EDS converted existing Army base software, added new DBMS software and computers, and will operate the regional processing centers (using Amdahl CPUs) for the Army over an eight-year period.

  - A smaller example is the Automated Land and Mineral Record System (ALMRS) for the Bureau of Land Management of the Interior Department, which was awarded to American Management Systems. System life is estimated at 12 years and is expected to cost $198.6 million.

- Some additional examples of combined operational FM/FM integration opportunities include the following:

  - Department of Housing and Urban Development Integrated Information Processing Service (HIIPS), Washington, D.C. - Provide all of HUD's data processing equipment and services, including a network control center. The contractor is expected to replace the Sperry 1180s, several Honeywell DPS/695s, seven IBM 3081 and 4381 equivalents, and UTS and Honeywell terminals. Contract term is five years with five one-year options.

- NASA Goddard Space Flight Center (MD) - Systems, Engineering, and Analysis Support (SEAS) - RFP in 1987 with a contract that includes options for about 10 years, approximately 1,200 man-years per year of effort, including replacement of undersized data processing resources. The contract will replace current technical/operational FM support from six contractors.

APPENDIX E: COMPETITORS IN COMMERCIAL FM

APPENDIX E: COMPETITORS IN COMMERCIAL FM

A. FEDERAL GOVERNMENT FM VENDORS

- These are vendors who have established their capabilities in the federal market and may transport those skills to commercial markets. They include:

  - GM/Electronic Data Systems.
  - Martin Marietta Data Systems.
  - Unisys (Burroughs/Sperry).
  - Scientific Applications.
  - Control Data Corporation.
  - Computer Sciences Corporation.
  - IBM.
  - BDM.
  - Planning Research Corporation.
  - Ford Aerospace.

B. COMPUTER HARDWARE VENDORS

- With a significant portion of the expenditure for FM going to hardware, it is not surprising that users look to hardware vendors as the prime contractor and, therefore, the "integrator." These vendors include (or may include):

  - IBM.
  - Data General.
  - Unisys (Burroughs/Sperry).
  - Digital Equipment.
  - Harris.
  - Hewlett Packard.
  - NCR.
  - Tandem.

C. ACCOUNTING FIRMS

- These firms have extensive top management contacts and experience in many large organizations. Companies to watch include:

  - Arthur Andersen.
  - Coopers & Lybrand.

- Deloitte, Haskins & Sells.
- Ernst & Whinney.
- Peat, Marwick & Mitchell.
- Arthur Young.

D. MANAGEMENT SERVICES FIRMS

- Leveraging skills in large project management efforts, the following firms potentially offer capabilities on the management side of large-scale integration contracts:
  - American Management Systems.
  - Bolt, Beranek and Newman.
  - Booz, Allen, Hamilton.

APPENDIX F: VENDOR SELECTION CRITERIA

APPENDIX F: VENDOR SELECTION CRITERIA

- INPUT's survey of federal agency professional services vendor selection criteria revealed some differences between civilian and defense agencies:

Vendor Criteria	Selection Ranking Civilian	Defense
Technical solutions	1	1
Proposed cost	3	2
Vendor reputation	2	3
Risk Containment	4	4
Contract type	5	5

- INPUT also surveyed agency views of successful contractor characteristics, with these results:

Contractor Characteristic	Agency Importance Civilian	Defense
Price	5	1
Support	3	2
Staff Experience	1	5
Software Development	3	3
Application Experience	2	5
Hardware Experience	6	3
Integration Experience	7	7
Federal Contracts	8	4
Agency Experience	4	7

- Agencies and vendors were also asked to rank key satisfaction factors with contractors:

Factor	Agencies	Vendors
Response	1	5
Quality	2	2
Delivery	3	4
Quantity	4	1
Cost	5	3

- Each Request for Proposal (RFP) lists the key decision factors that apply to that specific opportunity.

  - Most technical proposals of the type involved in FM integration will emphasize the proposed technical solution, experience of the key members of the technical team, and contractor procedures to assure project control and quality.

  - Most operational FM RFPs will ask for biographies of the committed members of the management team, certificates of employment of lead technical staff, a manning plan (30-, 60-, or 90-day), and explanation of related experience (or prime or subcontractors). In some instances, the bidder is asked to submit a work plan and proposed schedule for a typical task enumerated in the RFP.

  - The relative weighting of the bids indicated in the RFP are subject to additional weighting by the agency source selection authority.

- Winning criteria vary with the people and agency traditional contracting procedures. Some general guidelines have appeared in recent awards.

  - Operational FM contracts are won by bidders with:

- Low overhead loadings.
- Widest possible span of supervisory control.
- Use of strong technical staff that requires little supervision.
- Clear understanding of how the facility operates and priorities.
- Close coupling on-site between contractor and agency management.
- On-site management has complete contract authority.
- Available additional staff on-call off-site.

- FM integration contractors with high win rates offer:
  - Minimum acceptable solution (cost-driven) with inherent flexibility for growth and modification.
  - Key personnel with experience in the function(s) to be performed.
  - Flexible architecture that complies closely with the stated specifications.
  - Implied but not offered or priced enhancements suggested by agency technical personnel.
  - Strong but brief summary of features offered and why the vendor should be awarded the contract.
  - Fixed-price bid with identified risk containment procedures.

- Well-written management policies, procedures, and practices that provide full visibility of project status to the agency.